



Energy Imbalance Market GHG Design Discussion

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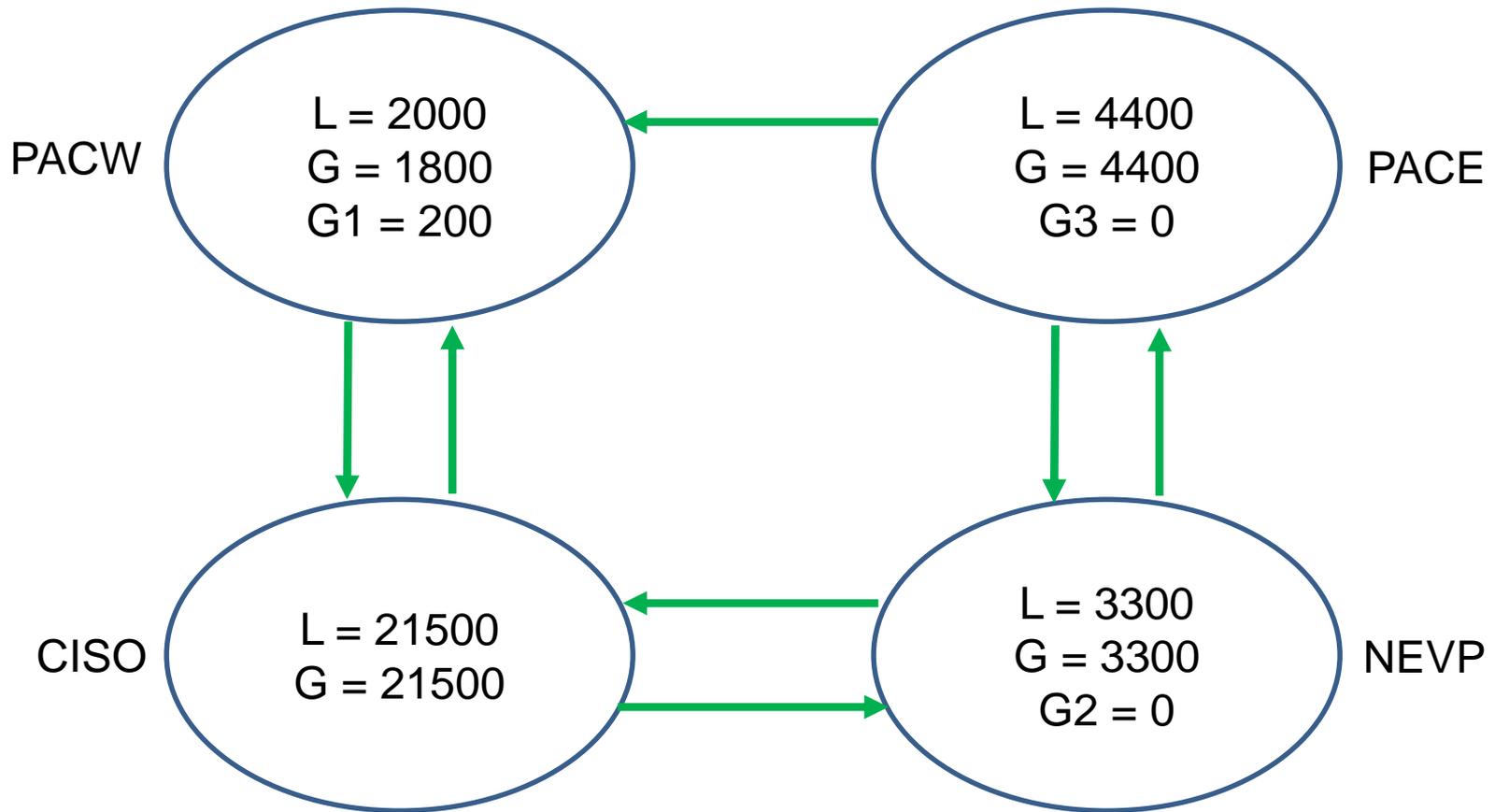
Regional Issues Forum

August 4, 2016

Topic – Accounting for atmospheric effects of least cost dispatch

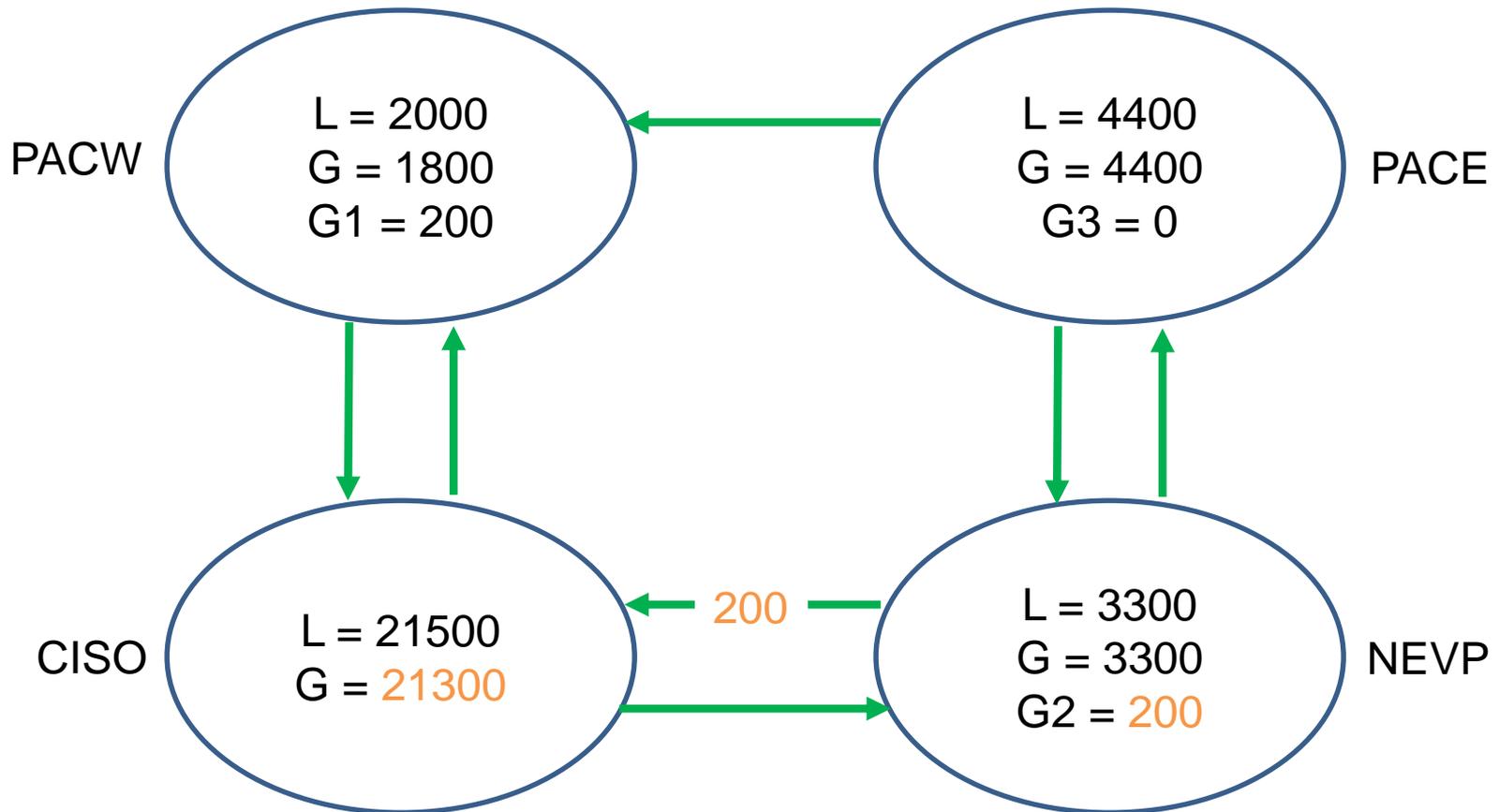
- Least cost dispatch can have effect of sending low emitting resources to CAISO, while not accounting for secondary dispatch of other resource to serve external demand.
- Least cost dispatch across CAISO and EIM allow CAISO renewables to displace external emitting resources.

All EIM balancing authority areas are balanced prior to the start of the EIM operating hour



↔ EIM Transfer Limits

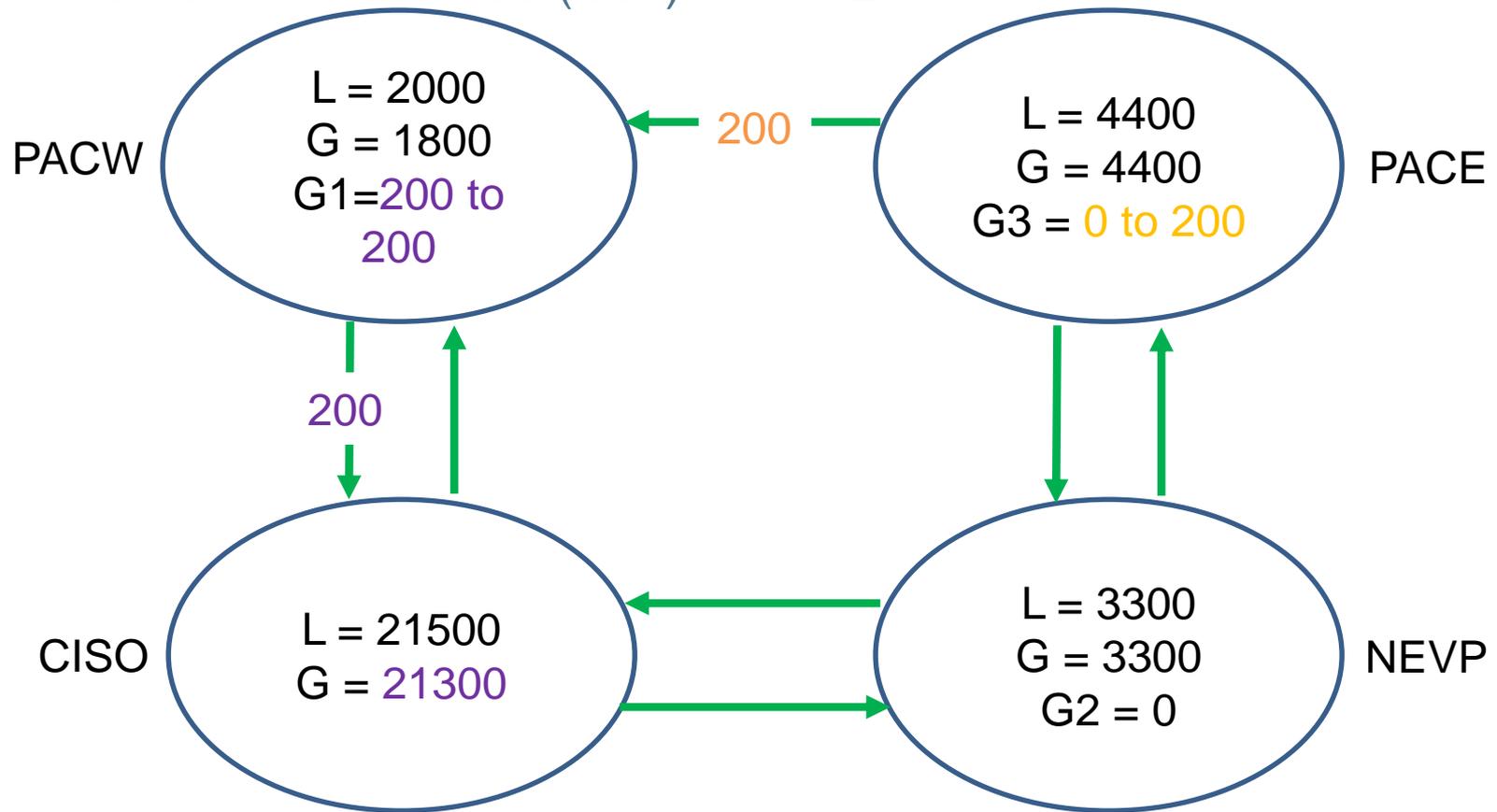
Least cost dispatch to serve load across EIM area. Primary dispatch and GHG awards are aligned



G2 receives 200 MW incremental primary dispatch
G2 receives 200 MW GHG obligation
200 MW transfer from NEVP to CISO

Least cost dispatch to serve load across EIM area.

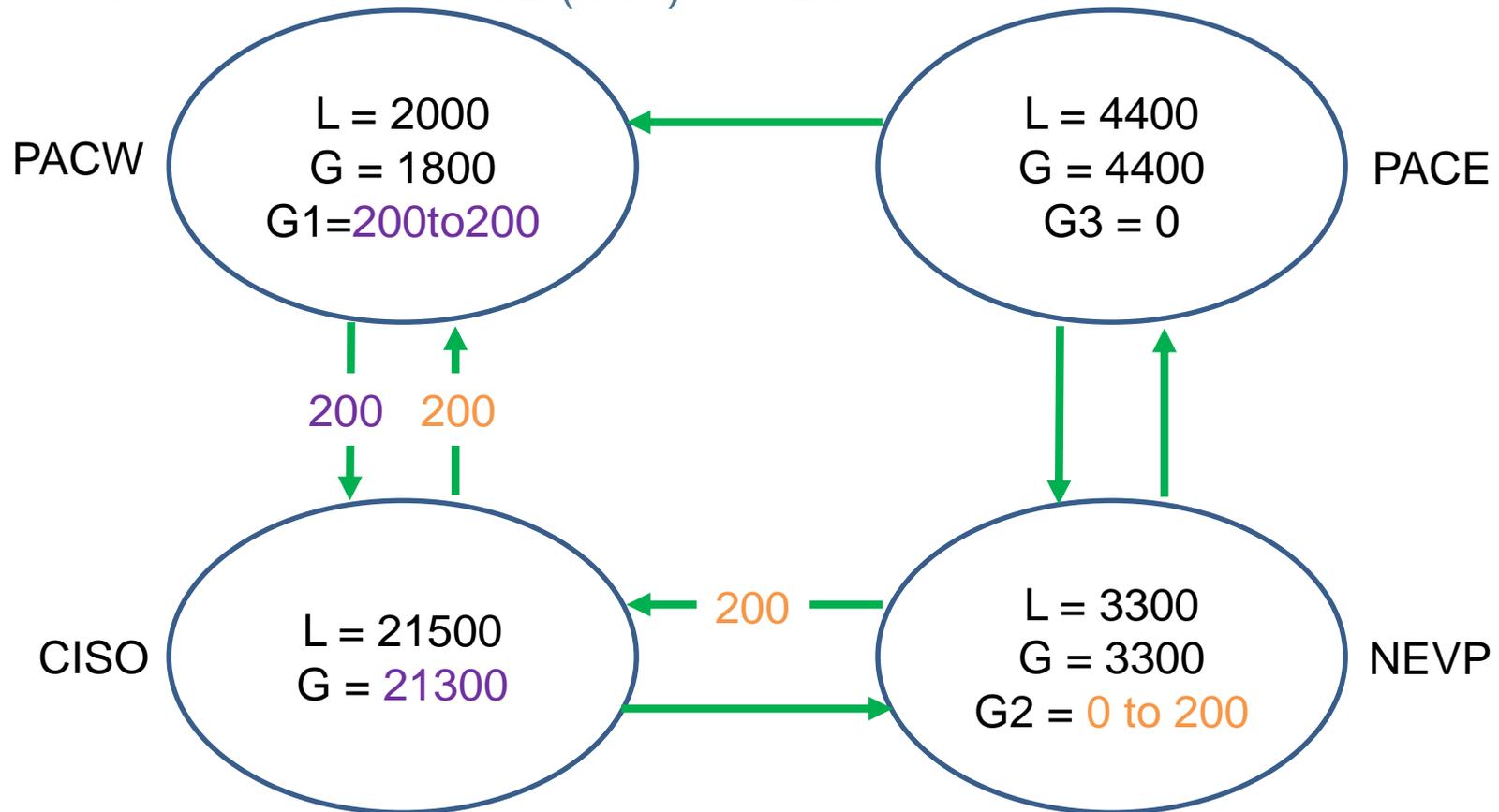
Primary dispatch with “secondary” dispatch because G1 (Hydro) bids lower GHG adder than G3 (Gas) in PACE



G1 receives 200 MW primary dispatch & GHG obligation at resource's emission rate
G3 receives 200 MW incremental secondary dispatch
200 MW transfer from PACW to CISO

Least cost dispatch to serve load across EIM area.

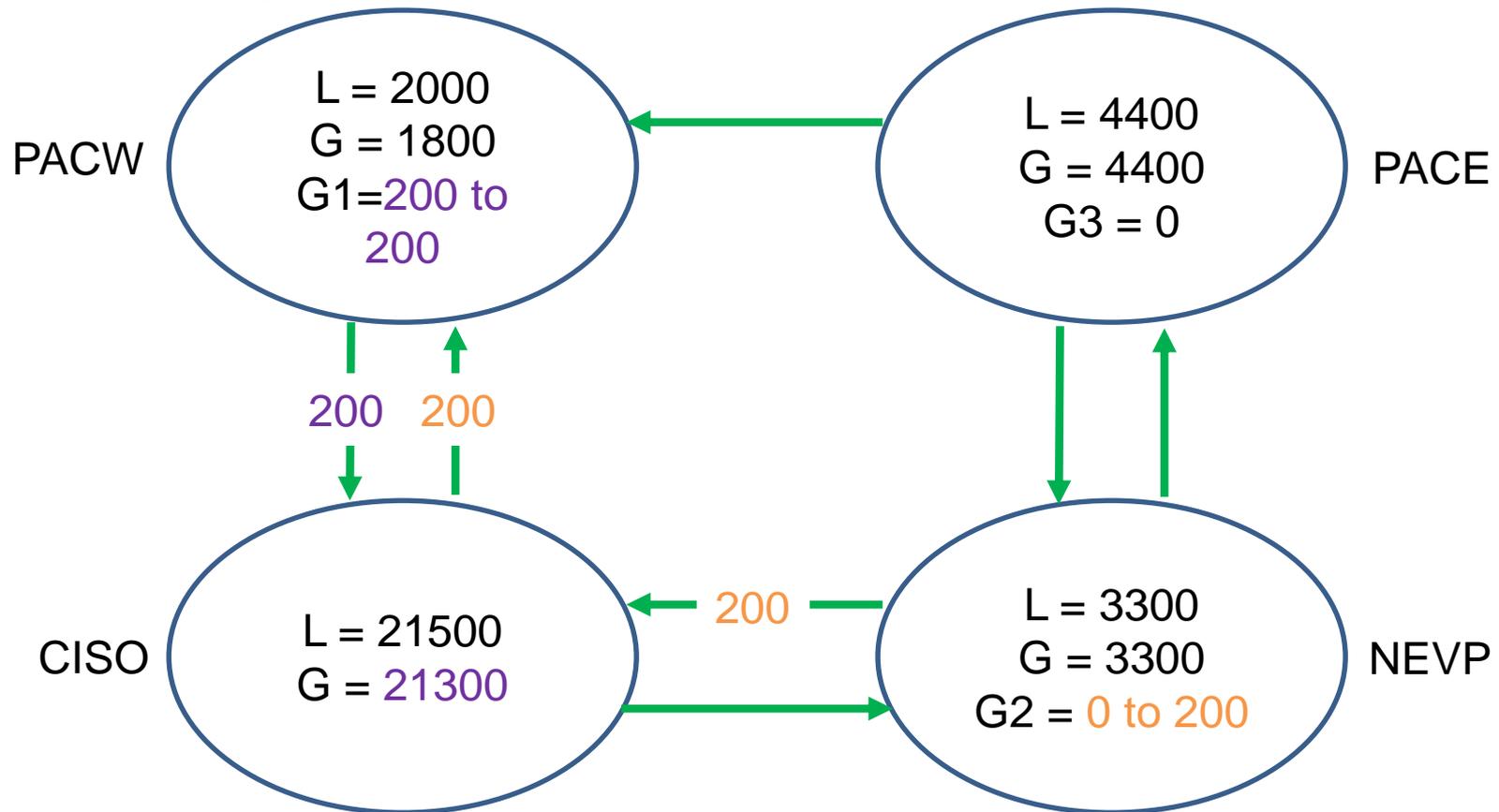
Primary dispatch with “secondary” dispatch because G1 (Hydro) bids lower GHG adder than G2 (Gas) in NEVP



G1 receives 200 MW primary dispatch & GHG obligation at resource's emission rate
G2 receives 200 MW incremental secondary dispatch
200 MW transfer from NEVP to CISO

Least cost dispatch to serve load across EIM area.

Primary dispatch with “secondary” dispatch for GHG because G2 did not submit a GHG bid



G1 receives 200 MW primary dispatch & GHG obligation at resource's emission rate
G2 receives 200 MW incremental secondary dispatch
200 MW transfer from NEVP to CISO

Several options have been considered to enable CARB to account for secondary dispatch (1 of 2)

1. Calculate emissions of secondary dispatch and assign GHG obligation to CAISO load imbalances
2. Require a minimum GHG bid for low emitting resources using the system emission rate
3. Create a hurdle rate using system emission rate for EIM transfers into ISO

Legal/regulatory and market inefficiency impacts of options need evaluation

Several options have been considered to enable CARB to account for secondary dispatch (2 of 2)

4. Adjust the caps down or retire GHG allowances by the amount of estimated secondary dispatch effects
5. Ensure dispatch and accounting considers other costs such that lower cost but higher emitting resource gets allocated to support transfer to CA
6. Have CAISO become a regulated party and any obligations based on system or asset controlling supplier rate

Legal/regulatory and market inefficiency impacts of options need evaluation

CARB is proposing regulatory amendments to account for GHG atmospheric impacts under EIM

- CARB held a workshop on June 24 regarding potential changes to its regulations affecting the electricity sector.
- CARB has issued proposed amendments to its cap and trade and mandatory GHG reporting regulations to take compliance period beginning January 1, 2018
<http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm>
- Comment period closes September 19, 2016.
- CAISO will continue to work with CARB and stakeholders to examine alternatives.